

Section 666—Vertical Drainage Wicks

666.1 General Description

This work includes furnishing and installing vertical drainage wicks according to locations and depths shown on the Plans, or as directed by the Engineer.

666.1.01 Definitions

General Provisions 101 through 150.

666.1.02 Related References

A. Standard Specifications

Section 106—Control of Materials

B. Referenced Documents

ASTM D 4632

ASTM D 751

ASTM D 1424

666.1.03 Submittals

A. Materials Certification

Furnish the Engineer with materials certification, in duplicate, according to Subsection 106.05, “Materials Certification.”

B. Installation Sequence and Method Details

Submit installation sequence and method details to the Engineer for review at least two weeks before installing the drainage wick.

The Engineer’s approval of the installation sequence and method does not constitute acceptance of the installation method.

If at any time the Engineer feels the installation method does not produce a satisfactory drainage wick, alter the method or equipment to comply with these Specifications.

666.2 Materials

A. Drain Fabrication

Ensure the following:

- Drainage wicks are prefabricated from a drainage plastic core fabricated with suitable channels wrapped in a nonwoven polyester filter.
- The brand of prefabricated drain used is AMERDRAIN or MEBRA, or an equivalent approved by the Geotechnical Engineering Bureau.
- The drain is free of defects, rips, holes, or flaws.

B. Physical Properties

Ensure that the drain meets minimum requirements according to the following:

		Filter
Breaking Load	ASTM D 4632	30 lbs/in width (5 N/mm width)
Mullenburst	ASTM D 751	85 lbs/in ² (585 kPa)
Elmendorf Tear	ASTM D 1424	200 grams
Permeability Coefficient		1x10 ⁻⁴ in/sec (3x10 ⁻³ mm/s)

666.2.01 Delivery, Storage, and Handling**A. Drain Protection**

Ensure that the drain is wrapped in burlap or a similar heavy-duty covering during shipment and storage.

B. Storage Protection

Protect the storage area from sunlight, mud, dirt, dust, debris, and detrimental substances.

666.3 Construction Requirements**666.3.01 Personnel**

General Provisions 101 through 150.

666.3.02 Equipment

The Contractor is responsible for selecting the proper size and amount of equipment.

A. Approval of Equipment

Adhere to the following requirements for equipment:

1. Secure approval of all equipment before beginning work.
2. Promptly replace or supplement unsatisfactory equipment.
3. Note that equipment is approved for use on a trial basis.
4. Remove, replace, or supplement equipment that proves unsatisfactory after a short test section is complete.

B. Required Equipment

Choose a type of carrier depending upon the desired installation force, and then ensure the following:

- The carrier is equipped with a mandrel or sleeve to protect the wick from tears, cuts, and abrasions during installation.
- The protective mandrel or sleeve has at least a 10 in² (6450 mm²) cross sectional area.

C. Precautions

Take precautions to protect instrumentation devices.

Replace, at no additional cost to the Department, any equipment that is damaged or becomes unreliable during construction due to construction operations.

666.3.03 Preparation**A. Location Stakes**

Prior to drain installation, the Engineer will stake the proposed drain locations. Take reasonable precautions to preserve the stakes.

Ensure that drain locations do not vary by more than 6 in (150 mm) from locations indicated on the Plans, or as directed by the Engineer.

B. Trial Drain

Install a trial drain at a location designated by the Engineer to demonstrate that the equipment, method, and materials will provide a satisfactory installation according to this Specification.

666.3.04 Fabrication

General Provisions 101 through 150.

666.3.05 Construction**A. Installation Depth**

1. Install drainage wicks to the depth shown on the Plans, or to a depth where reasonable efforts at further penetration fail.

The Engineer may vary the wick depths, spacings, or numbers installed, and may revise Plan limits for this work.

2. Provide a means of determining the wick depth and quantity of wick used at each drain location and at anytime.

B. Installation of Drains

1. Normal Installation

Use a mandrel or sleeve to install the drainage wick, as follows:

- a. Ensure that the mandrel or sleeve completely encloses and protects the drainage wick during installation.
- b. Force the mandrel containing the wick vertically into the ground to the required depth.
- c. Cut the mandrel neatly at its upper end after installation.
- d. Ensure that a 4 in to 8 in (100 mm to 200 mm) length of wick protrudes from the ground.

2. Drilling Upper Soils

If necessary, drill through the dense upper soils before installing the prefabricated drains. Do not drill more than 2 ft (600 mm) into the underlying compressible soils, as determined by the Engineer.

3. Obstruction of Depth

If obstructions cannot be penetrated using normal and accepted procedures, do the following:

- a. Complete the drain from the point of obstruction to the surface.
- b. Notify the Engineer.
- c. At the direction of the Engineer, install a new drain within 18 in (450 mm) of the obstructed drain.

4. Wick

Make splices or connections in the drainage wick to ensure continuity.

C. Wick Alignment

1. Carefully check equipment for plumbness before advancing each wick.
2. Ensure that wicks do not deviate more than 1 in/ft (85 mm/m) from the vertical.

666.3.06 Quality Acceptance

No compensation will be allowed for materials, work performed, or drilling if wicks are unsatisfactory. The Engineer will reject wicks that are:

- Out of location by more than 6 in (150 mm)
- Damaged in construction
- Improperly completed

666.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

666.4 Measurement

This work is measured according to the following:

- Drill holes are measured in linear feet (meters), to the nearest 0.1 ft (0.03 m).
- Vertical drainage wicks are measured in linear feet (meters), to the nearest 0.1 ft (0.03 m).

666.4.01 Limits

General Provisions 101 through 150.

666.5 Payment

This work will be paid for at the Contract Price for the accepted quantity of drill holes and vertical drainage wicks, complete and in-place. Payment is full compensation for:

- Drilling holes
- Furnishing materials
- Placing materials
- Providing labor, equipment, tools, and incidentals necessary to complete the work

The Contract Price will be for the number of drains at the spacing shown on the Plans.

Payment will be made under:

Item No. 666	Drill holes	Per linear foot (meter)
Item No. 666	Vertical drainage wicks	Per linear foot (meter)

666.5.01 Adjustments

General Provisions 101 through 150.

Section 667—Horizontal Drain

667.1 General Description

Specifications for this work will be included elsewhere in the Contract.

Section 668—Miscellaneous Drainage Structures

668.1 General Description

This work includes constructing catch basins, drop inlets, manholes, junction boxes, spring boxes, drain inlets, special inlets with safety grates, and vertical tee sections.

Construct according to these Specifications and the lines and grades shown on the Plans, or as established by the Engineer.

668.1.01 Definitions

General Provisions 101 through 150.

668.1.02 Related References

A. Standard Specifications

Section 207—Excavation and Backfill for Minor Structures

Section 500—Concrete Structures

Section 607—Rubble Masonry

Section 608—Brick Masonry

Section 801—Fine Aggregate

Section 830—Portland Cement

Section 834—Masonry Materials

Section 843—Concrete Pipe

Section 853—Reinforcement and Tensioning Steel

Section 854—Castings and Forgings

Section 866—Precast Concrete Catch Basin, Drop Inlet, and Manhole Units

B. Referenced Documents

General Provisions 101 through 150.

668.1.03 Submittals

General Provisions 101 through 150.

668.2 Materials

The structures in this section may be constructed of brick, cast-in-place concrete, or pre-cast concrete, unless the Plans or Proposal specifies a specific type of construction.